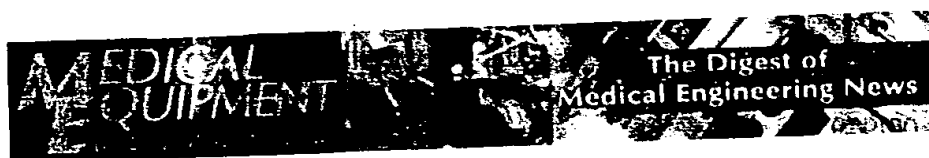
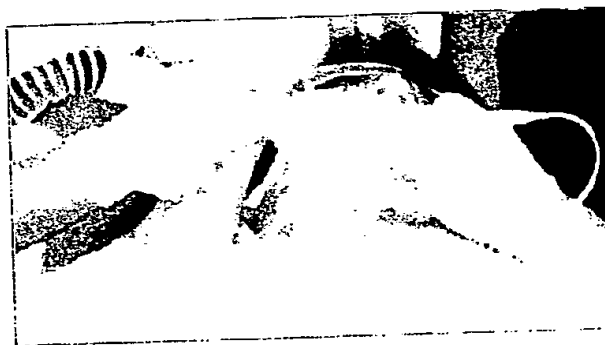


Exhibit K



Air Abrasion Brings Smiles to Patients, Dentists, Designers



— By Frances Richards

Biannual postcards from the dentist are perhaps only second to tax forms in the arena of unwanted mail. It's no secret — dental fear encourages many otherwise rational people to create absurd and unbelievable excuses for not going *you know where*. Dentists know it, dentaphobes know it, and so do medical equipment design engineers. Some of these engineers are bringing the rest of us good news with the welcome reality of minimally invasive dentistry, including air abrasion.

The first air abrasion units emerged in the 1950s, and quickly spread to many thousands of dental practices across the country. The Airdent air-abrasive unit by The S.S. White Company, Piscataway, NJ, arrived in 1951. Dentists could easily remove decay and prepare teeth for fillings, typically without anesthesia or the use of old low-speed handpieces. The problem was that amalgam was the only filling material available and it needed to be mechanically maintained by "under-cutting" the base of the prepared tooth, a process not well suited to air abrasion. The high-speed handpiece was then introduced in the late 1950s with the arrival of the Border air rotor — the first air turbine handpiece — fast becoming the dental tool of choice. Developments in composite resin technology during the 1970s and breakthroughs in the 1990s involving bonding agents fostered changes

in tooth preparation for filling placement, making mechanical retention processes a thing of the past. This, along with indicator dyes for improved decay detection and new abrasion equipment, has led to a resurgence of air abrasion systems. For example, S.S. White comes back to the future with Oz Dental, Inc., a new division that is entering the dental market with its own unique air abrasion system. Priced at \$5995, the Oz units have many unique features, such as an internal air pressure doubler, which allows dentists to use office air supply instead of relying on bulky compressors or compressed gas canisters, and "pneumatic logic," which enables dentists to change air pressure, and thus cutting speed, simply by pressing a button.

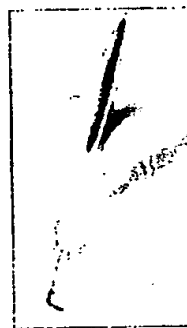
Besides traditional advantages of quick decay removal and tooth preparation, air abrasion also offers a new benefit – early exposure and detection of decay underneath tooth enamel, which often is difficult to detect using conventional x-rays, visualization and exploration. With air abrasion, areas can be exposed and either filled with composite resin as needed or sealed with pit and fissure sealants.

Other dental uses of air abrasion include tooth polishing and bonding preparation. Polishing teeth is achieved by decreasing the air pressure at which particles are delivered and decreasing particle size. By varying pressure and particle size, air abrasion can be used to micro-etch the surface of teeth in preparation for bonding.

Air abrasion cannot be used on all patients, as equipment has primarily been designed for use to treat small fissures, rather than large cavities. Painless pediatric dentistry has been one of the most successful applications and many dentists claim that the new equipment allows them to repair small cavities much more quickly than traditional methods, and without Novocain.

Details, Details

Air abrasion may best be described as high tech mini-sandblasting. Air abrasion devices spray a fine stream of aluminum oxide particles that "blow away" decay, with dentists controlling the cut by adjusting the amount and pressure of the particle stream. Particles delivered at high speed abrade tooth enamel and enable dentists to remove decayed material in preparation for fillings or placement of sealants.



Air abrasion is quiet, does not produce the vibrations or the heat of a drill, and for many patients requires little or no anesthesia. Negative aspects of tooth cutting via air abrasion include messy aluminum oxide debris from the procedure, the reality that air abrasion is suited to only some aspects of dentistry, potential for overuse among dentists,

and a potential health hazard for clinicians who must be certain their face masks fit tightly to avoid inhalation of aluminum oxide debris. Finally, availability and cost are issues as well, though as with many new technologies, costs are decreasing and availability of models and price ranges are increasing. Relatively low-cost devices are now available beginning around \$1,000, with more deluxe models costing upwards of \$20,000. A new disposable unit that sells for less than \$10 per cartridge has recently been introduced as well. The following case studies illustrate how two different companies engineered air abrasion units to solve specific problems. SMLX Technologies (Simplex Airbrator) battles cost and contamination issues, while Midwest Dental Products (AirTouch) confronts footprint and mobility issues, as well as particle evacuation, logical control and ergonomics.

According to current estimates, about 17% of dentists use air abrasion for tooth preparation, an increase of 15% in just two years.



Simplex Airbrator by SMLX: Disposable, Low Cost

Designers at SMLX Technologies, Hallandale, FL have developed the first simple to use, disposable, air abrasive dental handpiece designed to fit any standard handpiece connector. Two major drawbacks to air abrasion -- threat of contamination and capital expenditure on a major piece of equipment -- have been eliminated. The single use, disposable unit removes the fear of contamination, saves setup time for the assistant and removes the expense of an equipment purchase as well as the need for sterilization of parts. Stainless steel and polymer construction, an adjustable tip, and the ability to use different particle sizes make this disposable system a cost-effective and useful dental tool, which uses existing dental office air compressors. A patented delivery system maintains a constant particle flow at easily achieved pressure, which greatly decreases the degree of powder overspray in the operatory.

The Airbrator is the size of a 10cc syringe and is prefilled with one of three solutions -- sodium bicarbonate for cleaning, 50 micron aluminum oxide for etching or 27 micron aluminum oxide for cutting. It fits in place of a hi-speed drill on an existing handpiece connector. Zero maintenance and complete infection control are two major benefits. The needle coming out of the end of the unit can be adjusted to fit the patient's mouth. Each cartridge contains enough material to last for 60-70 seconds of use, which is enough time to perform most procedures indicated for air abrasion. Pressure required is between 35-45 psi for polishing and 60-70 psi for cutting. The unit has received 510K FDA clearance. Henry Schur, vice president and product

designer at SMLX said, "We applied basic physics and common sense to a problem - how much energy or force is needed to propel the particles out the end of the device?" The answer was in combining the correct particle size with the energy behind the particles (air pressure) in order to achieve the desired clinical results of polishing, etching or cutting.

Design was completed in-house, with hand prototypes and a cycle of four or five different mold modifications that were reviewed by the dental community and the FDA throughout the development process. Start to finish project time, including gaining FDA approval, was 18 months. "My advice is not to over-engineer," says Schur. "A product can always be improved upon. Solving a specific problem and getting a quality product to market was our goal. We may not be the Rolls Royce of air abrasion, but we have an excellent, cost-effective tool for everyday practitioners. Our product makes the dentist's life easier and patients more comfortable, and we're happy with that." Cost is less than \$10 per unit.

AirTouch System by Midwest Dental: Precise, Clean, Ergonomic

Air Touch was designed by a group of eight design engineers, specifically for dental offices. Not only does the unit combat patient apprehension by its ability to treat cavities without Novocain, but the design also condenses a "formerly cumbersome and terrifying toolset into a friendly rollaround cabinet that invariably prompts comparisons to *Star Wars*' R2D2," according to *I.D. Magazine* in their "Best of Category" dental equipment review.



An ergonomic handpiece attacks cavities with high-speed particles, while another handpiece has built-in suction to evacuate aluminum oxide particles before they can spread over the operating area. Control panels are simple, yet state-of-the-art. Air pressure and particle size self-adjust in an optimal linear relationship as a technician monitors and adjusts a control panel.

The first design challenge for the IDEO design team was to make an air abrasive product that would be comfortable for the dentist in both a physical sense and a cognitive one, by allowing dentists to use existing skill sets. Designers also needed to manage the aluminum oxide powder, to keep it from spreading over the operatory. Powder mess had been a major concern in air abrasion design.

AirTouch has a "friendly, nonthreatening" design and the smallest tower footprint in the industry, making it easy to integrate into existing

practices. Providing its own vacuum system prevents wear on existing dental systems, and comfortable hand tool design promotes acceptance by dentists as well. A sophisticated software-based control panel with digital display makes system operation and maintenance easy. An on-board evacuation system provides both intra- and extra-oral powder evacuation, capturing 90-94% of the aluminum oxide dust, while comparable units often capture only 50%. Users may select an oil-less compressor that delivers pressures of 40-120 psi, or use an onboard CO₂ tank to provide quieter, cleaner, instant air pressure.

Dan Tarullo, product manager, says, "Our goal is to give the best cut at the lowest pressure." That is precisely why the system was designed to self-adjust particle flow with pressure, in order to let the dentist spend more time on the procedure, rather than on adjusting controls. The unit is designed for the dentist to control the handpiece and instrument, while an assistant adjusts the control panel as needed. The lightweight, comfortable handpiece was designed to "be an extension of the doctor's hand, the steering wheel of the equipment," says Tarullo. Cost of the tower system is between \$15,000 and \$17,500 depending on the model.

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